

Applicant : Michael D. Ruehle  
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### Remarks

The applicant thanks the examiner for the telephone interview of September 28, 2005, in which the claims and the Larson reference were discussed.

Below, the applicant's comments are preceded by related remarks of the examiner in the office action dated July 12, 2005, set forth in small bold type.

**2. Claims 1-23, 28-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Larson et al. US 4,833,468.**

**Regarding claims 1, 4-5, the claimed selecting a configuration for layers of a permuting network based on a set of integer factors of N, the number of signals to be permuted, and on pre-selected types of switches is disclosed by stages of switches and constructing the permuting network in layers by using the pre-selected types of switches based on selected configuration is disclosed by layered network comprising a class of multi-stage interconnection networks where parameters defining layered network include N number of processors connected to network and using  $\log_b N + 1$  stages of switches and  $N * (\log_b N + 1)$  switches, with N switches per stage. See column 2, lines 63-67, column 6, lines 10-22, lines 39-55.**

Larson does not disclose or suggest "determining integer factors of N, in which N represents the number of signals to be permuted," as recited in amended claim 1. Larsen discloses a layered network that is defined by three parameters: N - the number of processors connected to the network, b - the base of logarithms and number representation, and p - the number of planes of connections in the network (col. 4, lines 60-64), and that the layered network has  $\log_b N + 1$  stages (col. 6, line 22). Although some of the parameters of Larson's layered network may happen to be integer factors of N, Larson does not disclose or suggest "determining integer factors of N," as recited in claim 1.

Claims 6 and 24 are patentable for at least similar reasons as claim 1.

Claims 2-5, 7-10, and 26-27 are patentable for at least the same reasons as the claims upon which they depend.

**Regarding claims 11, 13-16, 28-29, the claimed apparatus with N input terminals, N being an integer, N output terminals is disclosed by layer network with N request terminals on the left side of network and N response terminals on right side of terminal. The claimed permuting network configured to form non-blocking signal paths that connects input terminals to output terminals in arbitrary order, the permuting network constructed from layers of switches of different types, each layer having same number of switches, each type of switch capable of selecting one signal is disclosed by layered network comprising a class of multi-stage interconnection networks where parameters defining layered network include N number of**

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processors connected to network and using  $\log b N + 1$  stages of switches and  $N^{(\log N + 1)}$  switches, with  $N$  switches per stage. Switch in stage denoted by Switch (stage-number, switch number) and connecting right-hand switch terminal to a left-hand switch terminal in next stage involves a change in stage number in coordinates. See column 6, lines 53-59.

Layered network involves switch setting algorithm to connect any permutation or combination of inputs to outputs. See column 2, lines 63-67, column 6, lines 10-22, lines 39-55, column 8, lines 43-48. There are  $b \cdot p$  input and output terminals with each terminal switching out one signal from the inputs. See Figure 6, column 4, lines 3 1-43, lines 60-67, column 5, lines 1-4, column 6, lines 10-55.

Larson does not disclose or suggest "[a] permuting network constructed from layers of switches that include  $w_1:1$ ,  $w_2:1$ , ..., and  $w_D:1$  switches or are constructed from  $w_1:1$ ,  $w_2:1$ , ..., and  $w_D:1$  switches," in which "at least two of  $w_1$ ,  $w_2$ , ...,  $w_D$  are different from each other," as recited in claim 11. Larson discloses using "identical switches" (col. 2, line 67, col. 6, line 15, col. 11, line 20) to construct a layered network. Although FIG. 6 of Larson discloses a layered network in which each of the first layer of switches is connected to one input signal, and each of the second to fourth layers of switches is connected to 6 input signals, the switches in all the layers are still identical switches. A switch having 6 inputs can be connected to different numbers of input signals (from 1 input signal up to 6 input signals), but the switch is still the same switch. Thus, Larson does not disclose a permuting network constructed from layers of switches that include  $w_1:1$ ,  $w_2:1$ , ..., and  $w_D:1$  switches or are constructed from  $w_1:1$ ,  $w_2:1$ , ..., and  $w_D:1$  switches, in which at least two of  $w_1$ ,  $w_2$ , ...,  $w_D$  are different from each other.

Claim 18 is patentable for at least similar reasons as claim 11.

Claims 12-13, 15-17, 19-23, and 29 are patentable for at least the same reasons as the claims upon which they depend.

Cancelled claims have been cancelled without prejudice. Any circumstance in which the applicant has addressed certain comments of the examiner does not mean that the applicant concedes other comments of the examiner. Any circumstance in which the applicant has made arguments for the patentability of some claims does not mean that there are not other good reasons for patentability of those claims and other claims. Any circumstance in which the applicant has amended a claim does not mean that the applicant concedes any of the examiner's positions with respect to that claim or other claims.

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Respectfully submitted,

Date: 9/29/2005

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*\* See attached document certifying that Rex Huang has limited recognition to practice before the U.S. Patent and Trademark Office under 37 CFR § 11.9(b).*

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